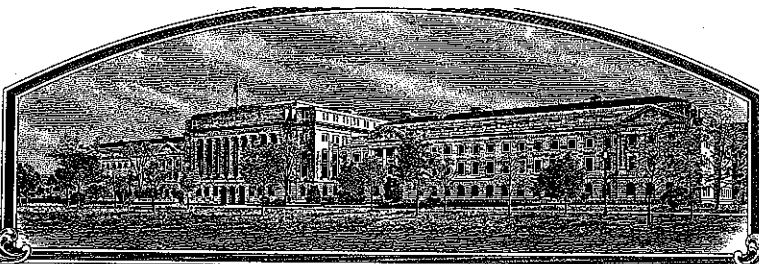


No.

200300277



THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Texas Tech University

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED DISTINCT VARIETY OF SEXUALLY REPRODUCED, OR TUBER PROPAGATED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF TWENTY YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, OR IMPORTING IT, OR EXPORTING IT, OR CONDITIONING IT FOR PROPAGATION, OR STOCKING IT FOR ANY OF THE ABOVE PURPOSE, OR CONDITIONING IT FOR PROPAGATION, OR STOCKING IT FOR ANY OF THE ABOVE PURPOSE, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT. (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

VERBENA, PRAIRIE

'Raider Amethyst'

In Testimony Whereof, I have hereunto set my hand and caused the seal of the Plant Variety Protection Office to be affixed at the City of Washington, D.C. this sixth day of March, in the year two thousand and six.

Attest:

R. M. Z...

Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

W. L. Johnson
Secretary of Agriculture

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
SCIENCE AND TECHNOLOGY - PLANT VARIETY PROTECTION OFFICE

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE
(Instructions and information collection burden statement on reverse)

The following statements are made in accordance with the Privacy Act of 1974 (5 U.S.C. 552a) and the Paperwork Reduction Act (PRA) of 1995.

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

1. NAME OF OWNER Texas Tech University		2. TEMPORARY DESIGNATION OR EXPERIMENTAL NAME TTU-PV4		3. VARIETY NAME Raider Amethyst "Vibrant Purple"	
4. ADDRESS (Street and No., or R.F.D. No., City, State, and ZIP Code, and Country) Director of Technology Transfer, Box 42007 Texas Tech University Lubbock, TX 79409-2007		5. TELEPHONE (Include area code) 806-742-4105		FOR OFFICIAL USE ONLY PVPO NUMBER 200300277 FILING DATE June 23, 2003	
		6. FAX (Include area code) 806-742-4103			
7. IF THE OWNER NAMED IS NOT A "PERSON", GIVE FORM OF ORGANIZATION (corporation, partnership, association, etc.) Public University		8. IF INCORPORATED, GIVE STATE OF INCORPORATION		9. DATE OF INCORPORATION	
10. NAME AND ADDRESS OF OWNER REPRESENTATIVE(S) TO SERVE IN THIS APPLICATION. (First person listed will receive all papers) Dr. Cynthia B. McKenney Department of Plant and Soil Science Box 42122 Texas Tech University Lubbock, TX 79409-2122				FILING AND EXAMINATION FEES: \$ 3652.00 DATE 6/23/03 CERTIFICATION FEE: \$ 768.00 DATE 2/27/06	
11. TELEPHONE (Include area code) 972-952-9285		12. FAX (Include area code) 972-952-9216		13. E-MAIL c-mckenney@tamu.edu	
14. CROP KIND (Common Name) Prairie Verbena					
15. GENUS AND SPECIES NAME OF CROP Glandularia bipinnatifida (Nutt) Formerly [Verbena bipinnatifida (Nutt)]		16. FAMILY NAME (Botanical) Verbenaceae		17. IS THE VARIETY A FIRST GENERATION HYBRID? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	
18. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED (Follow Instructions on reverse) a. <input checked="" type="checkbox"/> Exhibit A. Origin and Breeding History of the Variety b. <input checked="" type="checkbox"/> Exhibit B. Statement of Distinctness c. <input checked="" type="checkbox"/> Exhibit C. Objective Description of Variety d. <input checked="" type="checkbox"/> Exhibit D. Additional Description of the Variety (Optional) e. <input checked="" type="checkbox"/> Exhibit E. Statement of the Basis of the Owner's Ownership f. <input checked="" type="checkbox"/> Voucher Sample (2,500 viable untreated seeds or, for tuber propagated varieties, verification that tissue culture will be deposited and maintained in an approved public repository) g. <input checked="" type="checkbox"/> Filing and Examination Fee (\$3,652), made payable to "Treasurer of the United States" (Mail to the Plant Variety Protection Office)		19. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE SOLD AS A CLASS OF CERTIFIED SEED? See Section 63(a) of the Plant Variety Protection Act. <input type="checkbox"/> YES (If "yes", answer items 20 and 21 below) <input checked="" type="checkbox"/> NO (If "no", go to item 22)			
		20. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF CLASSES? <input type="checkbox"/> YES <input type="checkbox"/> NO IF YES, WHICH CLASSES? <input type="checkbox"/> FOUNDATION <input type="checkbox"/> REGISTERED <input type="checkbox"/> CERTIFIED			
		21. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO IF YES, SPECIFY THE NUMBER 1,2,3, etc. FOR EACH CLASS. <input type="checkbox"/> FOUNDATION <input type="checkbox"/> REGISTERED <input type="checkbox"/> CERTIFIED (If additional explanation is necessary, please use the space indicated on the reverse.)			
22. HAS THE VARIETY (INCLUDING ANY HARVESTED MATERIAL) OR A HYBRID PRODUCED FROM THIS VARIETY BEEN SOLD, DISPOSED OF, TRANSFERRED, OR USED IN THE U. S. OR OTHER COUNTRIES? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO IF YES, YOU MUST PROVIDE THE DATE OF FIRST SALE, DISPOSITION, TRANSFER, OR USE FOR EACH COUNTRY AND THE CIRCUMSTANCES. (Please use space indicated on reverse.)		23. IS THE VARIETY OR ANY COMPONENT OF THE VARIETY PROTECTED BY INTELLECTUAL PROPERTY RIGHT (PLANT BREEDER'S RIGHT OR PATENT)? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO IF YES, PLEASE GIVE COUNTRY, DATE OF FILING OR ASSUANCE AND ASSIGNED REFERENCE NUMBER. (Please use space indicated on reverse.)			

24. The owners declare that a viable sample of basic seed of the variety has been furnished with application and will be replenished upon request in accordance with such regulations as may be applicable, or for a tuber propagated variety a tissue culture will be deposited in a public repository and maintained for the duration of the certificate.

The undersigned owner(s) is/are the owner of this sexually reproduced or tuber propagated plant variety, and believe(s) that the variety is new, distinct, uniform, and stable as required in Section 42, and is entitled to protection under the provisions of Section 42 of the Plant Variety Protection Act.

Owner(s) is/are informed that false representation herein can jeopardize protection and result in penalties.

SIGNATURE OF OWNER

SIGNATURE OF OWNER

NAME (Please print or type)

NAME (Please print or type)

Texas Tech University by Lance Anderson

CAPACITY OR TITLE

DATE

CAPACITY OR TITLE

DATE

Director of TT and IP

9-27-04

GENERAL: To be effectively filed with the Plant Variety Protection Office (PVPO), ALL of the following items must be received in the PVPO: (1) Completed application form signed by the owner; (2) completed exhibits A, B, C, E; (3) for a seed reproduced variety at least 2,500 viable untreated seeds, for a hybrid variety at least 2,500 untreated seeds of each line necessary to reproduce the variety, or for tuber reproduced varieties verification that a viable (in the sense that it will reproduce an entire plant) tissue culture will be deposited and maintained in an approved public repository; (4) check drawn on a U.S. bank for \$3,652 (\$432 filing fee and \$3,220 examination fee), payable to "Treasurer of the United States" (See Section 97.5 of the Regulations and Rules of Practice.) Partial applications will be held in the PVPO for not more than 90 days, then returned to the applicant as unfilled. Mail application and other requirements to Plant Variety Protection Office, AMS, USDA, Room 401, NAL Building, 10301 Baltimore Avenue, Beltsville, MD 20705-2351. Retain one copy for your files. All items on the face of the application are self explanatory unless noted below. Corrections on the application form and exhibits must be initialed and dated. **DO NOT** use masking materials to make corrections. If a certificate is allowed, you will be requested to send a check payable to "Treasurer of the United States" in the amount of \$432 for issuance of the certificate. Certificates will be issued to owner, not licensee or agent.

Plant Variety Protection Office

Telephone: (301) 504-5518

FAX: (301) 504-5291

Homepage: <http://www.ams.usda.gov/science/pvpo/pvp.htm>

ITEM

- 18a. Give: (1) the genealogy, including public and commercial varieties, lines, or clones used, and the breeding method; (2) the details of subsequent stages of selection and multiplication; (3) evidence of uniformity and stability; and (4) the type and frequency of variants during reproduction and multiplication and state how these variants may be identified
- 18b. Give a summary of the variety's distinctness. Clearly state how this application variety may be distinguished from all other varieties in the same crop. If the new variety is most similar to one variety or a group of related varieties:
- (1) identify these varieties and state all differences objectively;
 - (2) attach statistical data for characters expressed numerically and demonstrate that these are clear differences; and
 - (3) submit, if helpful, seed and plant specimens or photographs (prints) of seed and plant comparisons which clearly indicate distinctness.
- 18c. Exhibit C forms are available from the PVPO Office for most crops; specify crop kind. Fill in Exhibit C (Objective Description of Variety) form as completely as possible to describe your variety.
- 18d. Optional additional characteristics and/or photographs. Describe any additional characteristics that cannot be accurately conveyed in Exhibit C. Use comparative varieties as is necessary to reveal more accurately the characteristics that are difficult to describe, such as plant habit, plant color, disease resistance, etc.
- 18e. Section 52(5) of the Act requires applicants to furnish a statement of the basis of the applicant's ownership. An Exhibit E form is available from the PVPO.
19. If "Yes" is specified (seed of this variety be sold by variety name only, as a class of certified seed), the applicant **MAY NOT** reverse this affirmative decision after the variety has been sold and so labeled, the decision published, or the certificate issued. However, if "No" has been specified, the applicant may change the choice. (See Regulations and Rules of Practice, Section 97.103).
22. See Sections 41, 42, and 43 of the Act and Section 97.5 of the regulations for eligibility requirements.
23. See Section 55 of the Act for instructions on claiming the benefit of an earlier filing date.

21. CONTINUED FROM FRONT (Please provide a statement as to the limitation and sequence of generations that may be certified.)

Varieties not included in seed certification program.

22. CONTINUED FROM FRONT (Please provide the date of first sale, disposition, transfer, or use for each country and the circumstances, if the variety (including any harvested material) or a hybrid produced from this variety has been sold, disposed of, transferred, or used in the U.S. or other countries.) Transplants provided to Turner Seed, located in Breckenridge, TX, to allow for establishment to increase seed for future harvest. Turner seed funded the development and has first right of refusal on the crop. The date of first release is May 15, 2003 after submission of the original PVP application. To date, no seed has been sold or released to anyone else.

23. CONTINUED FROM FRONT (Please give the country, date of filing or issuance, and assigned reference number, if the variety or any component of the variety is protected by intellectual property right (Plant Breeder's Right or Patent).)

None. PVP requested only for U.S.

NOTES: It is the responsibility of the applicant/owner to keep the PVPO informed of any changes of address or change of ownership or assignment or owner's representative during the life of the application/certificate. There is no charge for filing a change of address. The fee for filing a change of ownership or assignment or any modification of owner's name is specified in Section 97.175 of the regulations. (See Section 101 of the Act, and Sections 97.130, 97.131, 97.175(h) of the Regulations and Rules of Practice.)

To avoid conflict with other variety names in use, the applicant must check the appropriate recognized authority. For example, for agricultural and vegetable crops, contact: Seed Branch, AMS, USDA, Room 213, Building 306, Beltsville Agricultural Research Center-East, Beltsville, MD 20705. Telephone: (301) 504-8089. <http://www.ams.usda.gov/lsg/seed.htm>

According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0551-0055. The time required to complete this information collection is estimated to average 3.0 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, gender, religion, age, disability, sexual orientation, marital or family status, political beliefs, parental status, or protected genetic information. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at 202-720-2600 (voice and TDD).

To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 14th and Independence Avenue, SW, Washington, DC 20250-9410 or call 202-720-6254 (voice and TDD). USDA is an equal opportunity provider and employer.

81-470 (02-10-2003) designed by the Plant Variety Protection Office with WARD 2000. Replaces format versions of 81-470, which are obsolete.

DRAFT Exhibit A Form

1. Describe the genealogy (back to and including public and commercial varieties, lines, or clones used) and the breeding method(s).

During the summer of 1996, native seed accessions of Glandularia bipinnatifida were collected from four locations: ; TTU-PV1 collected 6/26/96 in Crosbyton, TX and identified for its tight growth habit and dark purple flowers; TTU-PV2 collected 6/3/96 in Carson City, TX notable for being found growing in almost pure caliche soil; TTU-PV3 was collected 7/8/96 in Dickens, TX and is recognized for its uniformity and heavy flowering; and TTU-PV4 was collected 7/8/96 in Fredericksburg, TX and is notable for its vigorous growth habit and lilac colored flowers.

In general, plant populations collected were selected for their long bloom period, dark flower color, and dense mounding growth habit. (continued on next page)

2. Give the details of subsequent stages of selection and multiplication.

Year	Detail of Stage	Selection Criteria
1996	Collected 4 accessions of Prairie Verbena and designated them TTU-PV1, TTU-PV2, TTU-PV3, and TTU-PV 4. TTU-PV1 was collected in Crosbyton, TX on June 26, 1996; 1996. TTU-PV2 was collected in was collected in Carson City, TX on June 3, 1996. TTU-PV 3 was collected in Dickens, TX on June 25, 1996. TTU-PV4 was collected in Fredericksburg, TX on July 8, 1996. The collected seed was cleaned and stored in a chilled environment. (continued on the next page)	Uniform density, foliage density, mounding habit, and dark floral color

3a. Is the variety uniform? ☒ Yes ☐ No

How did you test for uniformity?

The variety is uniform. Each season the selection has been grown the distinctive plant has retained a uniform and compact growth habit. Those plants that seem to be inferior were roughed during the initial years of evaluations. Comparison data supports the uniformity.

3b. Is the variety stable? ☒ Yes ☐ No

How did you test for stability? Over how many generations?

The variety is stable. During the field trials from 2000-2004, the 4 generations have had no discernable visual change in appearance. The compact habit and deep color have remained.

4. Are genetic variants observed or expected during reproduction and multiplication? ☐ Yes ☒ No

If yes, state how these variants may be identified, their type and frequency.

Continue on additional pages if necessary.

DRAFT Exhibit A Form Continued

1. Describe the genealogy.

The accessions were seeded in a greenhouse and transplanted into field plots in Lubbock, Texas following a randomization pattern to enhance the impact of open pollination. Seed was collected from each of the accessions and carried forward to the next year. The 4 accessions were once again planted out and TTU-PV1 was determined to have the best appearance. Seed of TTU-PV1 was collected from the best plants in that accession and carried through for the next year. This process was repeated several years until a stable line was created. Comparison tests were made with a selection sold by Plants of the Southwest.

TTU-PV1 'Vibrant Purple' exhibits a plant height at maturity of 27.57 cm with a spread of 113.80 cm. This mat-like perennial herb is composed of clusters of branched stems creeping on the ground and occasionally rooting at nodes in contact with the soil surface. Vibrant Purple is covered in blooms that start in early spring and remain until frost. The flowers are in rounded clusters or corymbs. Purple flowers (Purple-Violet Group N82A) RHS Color are 3.91 cm long and 3.47 cm across. The colorful tubular corolla is 1.42 mm wide and 5-lobed at the rim. The leaves of 'Vibrant Purple' are usually hispid, 4.46 cm long and 4.21 wide, opposite, with the blade pinnately lobed. The foliage is a yellow-green (Yellow-green Group 146A RHS Color). The calyx encloses the 4-celled ovary, producing 4 cylindrical seeds at maturity. The average 1000 seed weight is 2.23g.

2. Give the details of subsequent stages of selection and multiplication.

1997

The 4 accessions were transplanted into field plots in Lubbock, TX in a randomized pattern in order to help facilitate crossing by open pollination. At the end of the growing season, it was determined that TTU-PV1 performed the best in the replicated field plots, based on uniform appearance, floral density, foliage density, growth habit, and floral color. Studies on the other accessions were discontinued. Seed of TTU-PV1 from the most attractive plants was collected, cleaned, and stored for further study.

1998

TTU-PV1 was transplanted into field plots in Lubbock. Rouging was done to select for a uniform appearance, floral density, foliage density, growth habit, and floral color. About 10 % of the plants were rouged and seed was collected from the most attractive 5 plants, cleaned, and stored.

1999

TTU-PV1 was transplanted into Texas Tech University field plots in Lubbock, TX. Rouging was done to select for a uniform appearance, floral density, foliage density, growth habit, and floral color. About 1% of the plants were removed during this process. Seed was collected, cleaned, and stored.

2000

Seed collected at the Lubbock location was used to produce transplants for both the Dallas and Lubbock sites. In Dallas and Lubbock, TTU-PV1 plants was planted in an increase block and the seed was collected for use the following year.

2001

Seed collected in Dallas was used to produce transplants, which were established in field plots in Dallas. Seed was collected, cleaned and stored for use the following year.

2002

In Dallas, TTU-PV1 and the commercial Prairie Verbena from Plants of the Southwest were grown in field trials and comparison data was taken. In a second area removed from this location, and increase block of TTU-PV1 was grown and the seed collected for use the following year. Severe hail damaged our plant materials in the field and reduced our ability to take data and increase seed.

2003

During this year, we grew off 8,000 transplants to send to Breckenridge, TX to be grown as an increase field. In Dallas, comparison field trials were conducted and data obtained.

2004

In Dallas, comparison field trials were conducted and final data obtained.

DRAFT Exhibit B Form

Based on overall morphology, (TTU-PV1) 'Raider Amethyst' is most similar to Plants of the Southwest-
Prairie Verbena
Applicant's new variety *Most similar comparison variety(ies)*

(TTU-PV1) 'Raider Amethyst' most clearly differs from Plants of the Southwest-
Prairie Verbena in the following traits:
Applicant's new variety *Most similar comparison variety(ies)*
(Same one(s) named in the first sentence)

Name the specific trait, then list the value of that trait for each variety in the comparison. Attach appropriate supporting evidence (see the Guidelines for Presenting Evidence in Support of Variety Distinctness, available from the PVP Office or website)

1. Qualitative traits: (Eg. Leaf Pubescence) Leaf Morphology	Applicant's New Variety _____ <i>heavy pubescence</i> Leaves are more finely dissected	1 st Comparison Variety _____ <i>glabrous</i> Leaves have fewer lobes	Evidence <i>photograph attached</i> Photograph Attached (Fig. 1)
2. Color traits: (Eg. Leaf Color) Leaf Color Flower Color Flower Eye Color	<i>Dark Green (SGY 3/4)</i> Dark Green (Yellow-Green Group 146A) Dark Purple (Purple-Violet Group 82A) Light Yellow (Yellow Group 8D)	<i>Light Green (2,SGY 8/10)</i> Dark Green (Green Group 137B) Dark Purple (Violet Group 86B) Light Yellow (Yellow Group 1D)	<i>Munsell Color Chart</i> RHS Color Chart
3. Quantitative traits: (Eg. Plant Height) Leaf Width Inflorescence Width	<i>200 cm +/- 10 cm (N=25)</i> 4.61cm +/- .541 cm (N=15) 3.520 cm +/- .291 cm (N=15)	<i>250 cm +/- 15 cm (N=25)</i> 3.87 cm +/- .821 cm (N=15) 3.236 cm +/- .287 cm (N=15)	<i>statistics attached</i> Statistics and Photograph Attached (Fig. 2)
4. Other: Plant vigor	Vigorous growth; Denser flowers and foliage	Less dense flowers and foliage; Growth not compact	Photographs attached (Fig. 3-4)

Use additional tables to present clear differences for additional comparison varieties. Use additional pages to present supporting evidence.

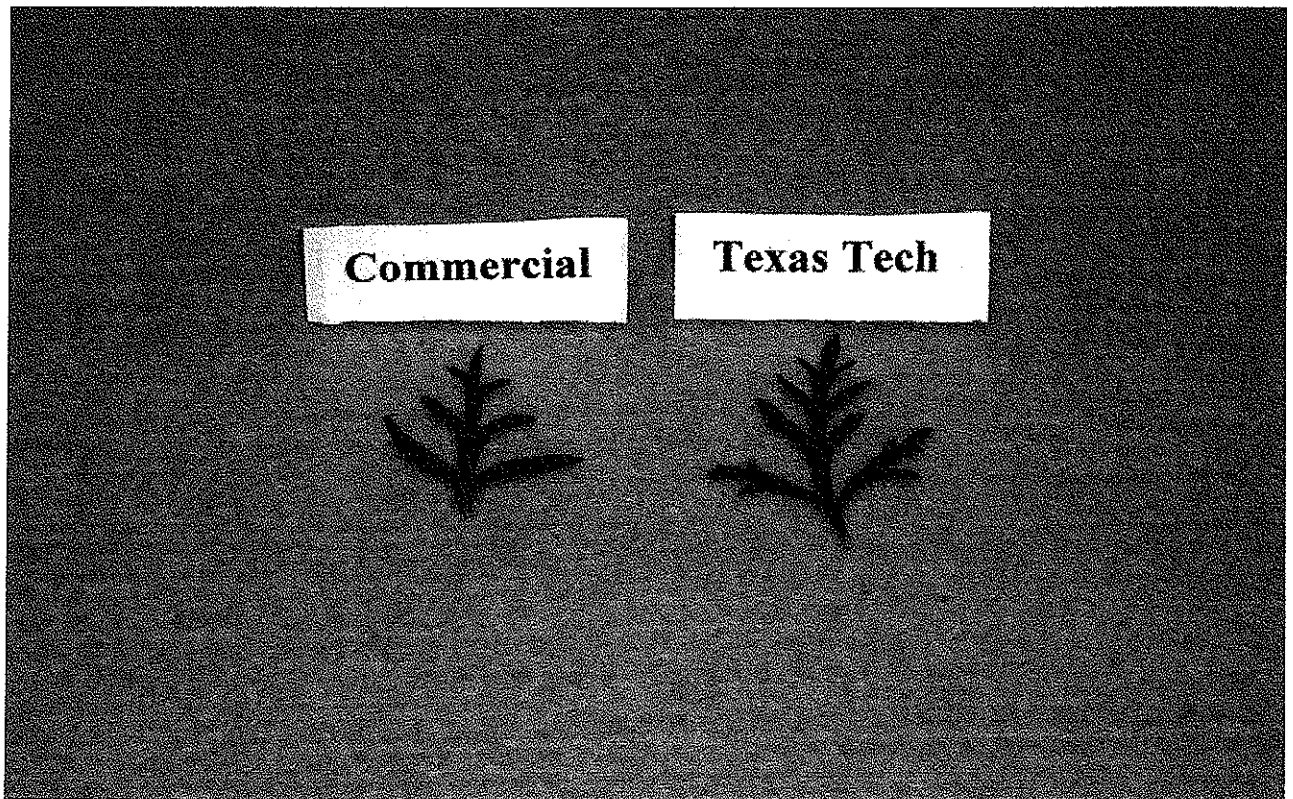
Exhibit D – Continued

Fig. 1. The foliage of the Texas Tech selection of Prairie Verbena has more finely dissected leaves and a greater number of lobes per leaf.

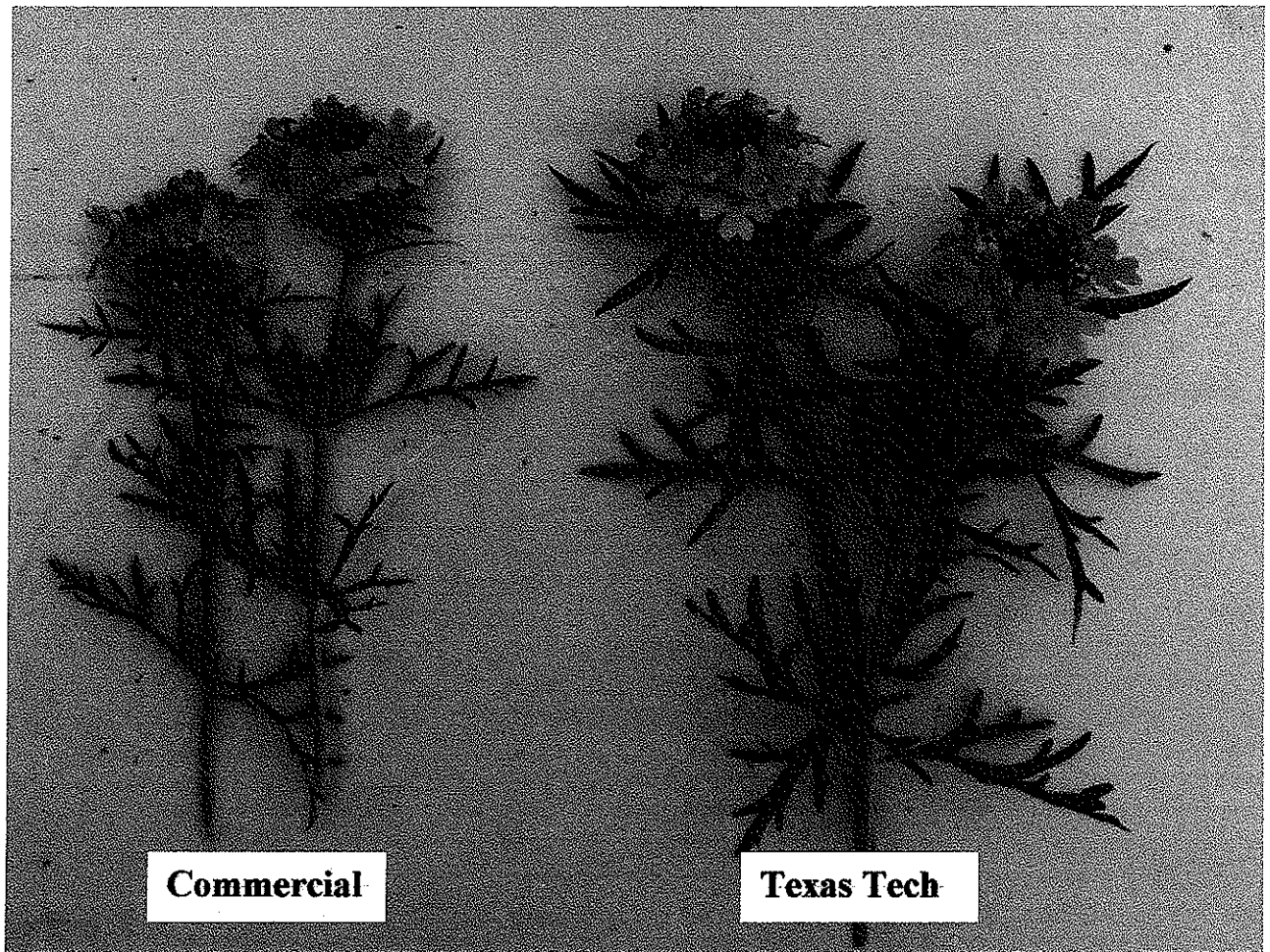


Fig. 2. The diameter of each individual floret and the overall plant is larger on the Texas Tech release as compared to the commercial release.

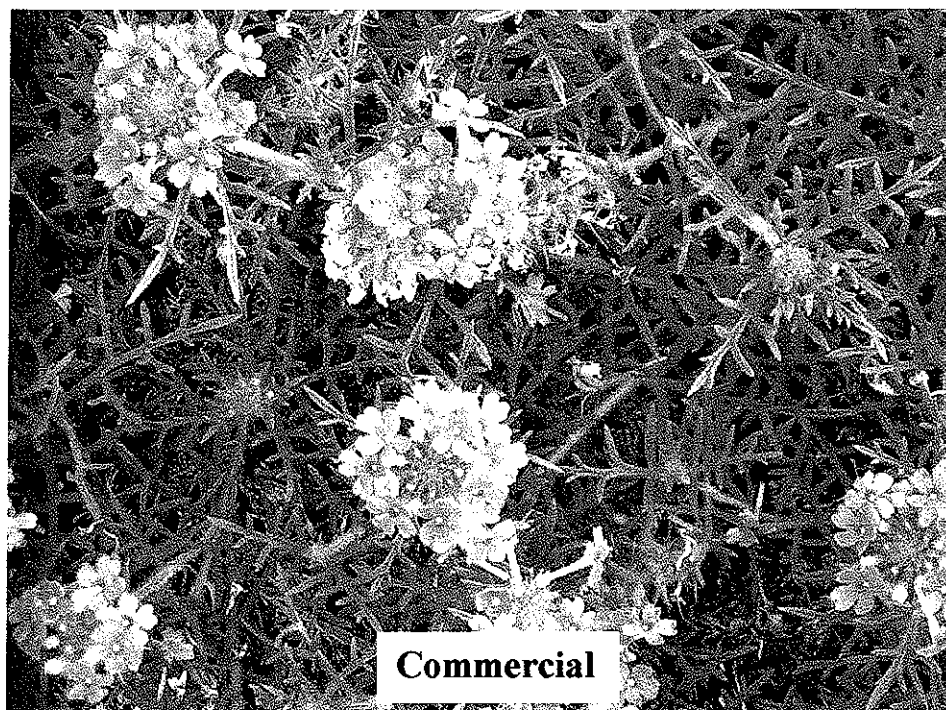


Fig. 3A. Example of a field grown commercial Prairie Verbena plant.

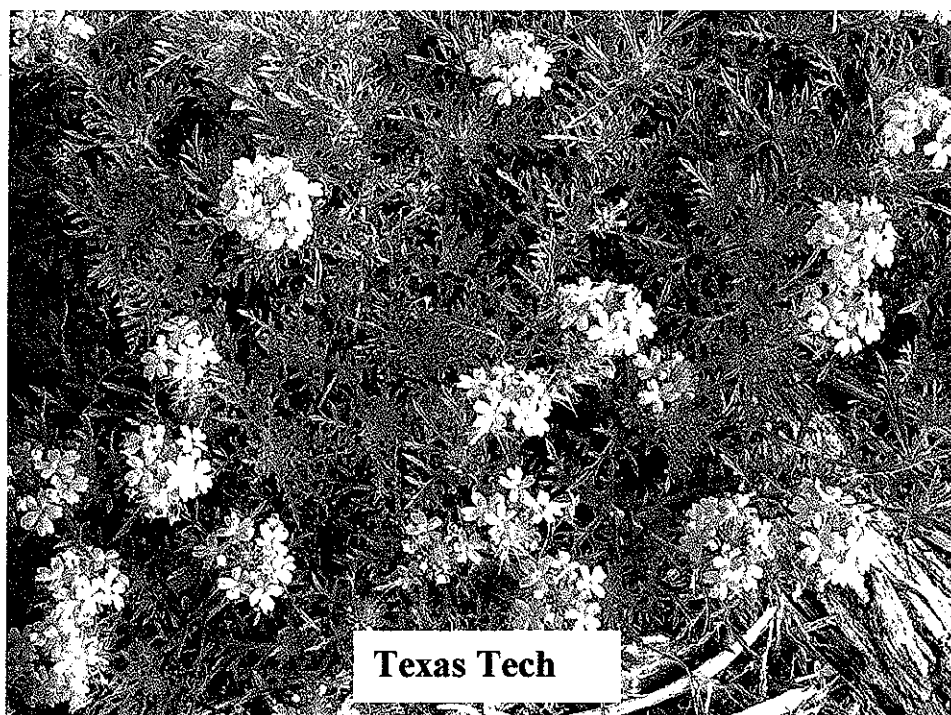


Fig. 3B. Example of a field grown TTU PV2 Prairie Verbena plant.

Statistical Analysis Report

Trial # 1, 2003

Variety Name	Trait	Mean	Standard Deviation of the Mean	Sample Size	Specific Statistical Analysis Used	Actual Statistic	Probability Value
TTU-PV1	Inflor Width	3.620 cm	0.246	15	1-way AOV	F=37.009	P ≤ 0.000
PSW Prairie	Inflor Width	3.067 cm	0.253	15			
Verbena							
TTU-PV1	Leaf Width	3.601 cm	0.517	15	1-way AOV	F=6.220	P ≤ 0.000
PSW Prairie	Leaf Width	3.214 cm	0.307	15			
Verbena							
Trial Information (date, place, treatment, weather conditions, etc.):							
3/2003 through 9/2003; Texas A&M Research and Extension Center in Dallas, Texas; Open pollination crosses; Field Plots; Clay soil							
Evidence of Appropriateness of Analysis:							
Data is homoskedastic per the Kolmogorov Smirnov Z test; One-way ANOVA used for analysis							
Evidence that Pooling data was appropriate (if done):							
Data was not pooled							
If different treatments, # Sites, # Plots per Site, # Plants per Plot:							
1 site each year, 3 blocks per site, 5 plants per block							

Statistical Analysis Report

Trial # 2, 2004

Variety Name	Trait	Mean	Standard Deviation of the Mean	Sample Size	Specific Statistical Analysis Used	Actual Statistic	Probability Value
TTU-PV1	Inflor Width	3.520 cm	0.291	15	1-way AOV	F=7.238	P ≤ 0.012
PSW Prairie	Inflor Width	3.236 cm	0.287	15			
Verbena							
TTU-PV1	Leaf Width	4.61 cm	0.541	15	1-way AOV	F=8.429	P ≤ 0.007
PSW Prairie	Leaf Width	3.87 cm	0.821	15			
Verbena							
Trial Information (date, place, treatment, weather conditions, etc.):		3/2004 through 9/2004; Texas A&M Research and Extension Center in Dallas, Texas; Open pollination crosses; Field Plots; Clay soil					
Evidence of Appropriateness of Analysis:		Data is homoskedastic per the Kolmogorov Smirnov Z test; One-way ANOVA used for analysis					
Evidence that Pooling data was appropriate (if done):		Data was not pooled					
If different treatments, # Sites, # Plots per Site, # Plants per Plot:		1 site each year, 3 blocks per site, 5 plants per block					

United States Department of Agriculture, Agricultural Marketing Service
Science Division, Plant Variety Protection Office
National Agricultural Library Building, Room 500
Beltsville, MD 20705

OBJECTIVE DESCRIPTION OF VARIETY
VERBENA (*Verbena Spp.*)

Name of Applicant(s) Texas Tech University	Variety Seed Source TTU-PA-1	Variety Name or Temporary Designation Vibrant Purple <u>Raider Amethyst</u>																								
Address (Street & No., or R.F.D. No., City, State, Zip Code and Country) Director of Technology Transfer, Box 42007 Texas Tech University, Lubbock, TX 79409-2007		<div style="border: 1px solid black; padding: 2px;">FOR OFFICIAL USE</div> PVPO Number <u>200300277</u>																								
Place the appropriate number that describes the varietal characters typical of this variety in the spaces below. Right justify whole numbers by adding leading zeroes if necessary. Completeness should be striven for to establish an adequate variety description. Traits designated by a "*" are considered necessary for an adequate variety description and must be completed.																										
COLOR CHOICES (Use in conjunction with Munsell color code to describe all color choices: describe #24 in Comments section): <table style="width: 100%; font-size: small;"> <tr> <td>01=Light Green</td> <td>02=Medium Green</td> <td>03=Dark Green</td> <td>04=Very Dark Green</td> </tr> <tr> <td>05=Green-Yellow</td> <td>06=Pale Yellow</td> <td>07=Yellow</td> <td>08=Yellow-Orange</td> </tr> <tr> <td>09=Orange</td> <td>10=Salmon</td> <td>11=Pink-Orange</td> <td>12=Pink</td> </tr> <tr> <td>13=Light Red</td> <td>14=Red</td> <td>15=Dark Red</td> <td>16=Pale Purple</td> </tr> <tr> <td>17=Purple</td> <td>18=Dark Purple</td> <td>19=Light Blue</td> <td>20=Blue</td> </tr> <tr> <td>21=Dark Blue</td> <td>22=White</td> <td>23=Cream</td> <td>24=Other (Describe)</td> </tr> </table>			01=Light Green	02=Medium Green	03=Dark Green	04=Very Dark Green	05=Green-Yellow	06=Pale Yellow	07=Yellow	08=Yellow-Orange	09=Orange	10=Salmon	11=Pink-Orange	12=Pink	13=Light Red	14=Red	15=Dark Red	16=Pale Purple	17=Purple	18=Dark Purple	19=Light Blue	20=Blue	21=Dark Blue	22=White	23=Cream	24=Other (Describe)
01=Light Green	02=Medium Green	03=Dark Green	04=Very Dark Green																							
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17=Purple	18=Dark Purple	19=Light Blue	20=Blue																							
21=Dark Blue	22=White	23=Cream	24=Other (Describe)																							
1. GENERAL INFORMATION: <u>3</u> Type of Variety: 1=Hybrid 2=Inbred (self-pollinated) 3=Open pollinated * <u>12</u> Species: 1=Bonariensis 2=Canadensis 3=Gooddingii 4=Hastata 5=X Hybrida(=X Hortensis) 6=Laciniata 7=Officinalis 8=Peruviana(=Chamaedrifolia) 9=Pulchella(=Tenera) 10=Rigida(=Venosa) 11=Tenuisecta 12=Other (Specify) <u>Glandularia bipinnatifida (Nutt)</u> <u>[Verbena bipinnatifida (Nutt)]</u> <u>6</u> Region Where Developed: 1=Northwest USA 2=Northcentral USA 3=Northeast USA 4=Southeast USA 5=Southcentral USA 6=Southwest USA 7=Other _____ * <u>3</u> Recommended Use: 1=Bedding 2=Pot 3=Not Specific	Comparison Variety Name <u>Prairie</u> Comparison Seed Source <u>Verbena plants of the Southwest</u> <u>3</u> <u>12</u> <u>6</u> <u>3</u>																									
2. MATURITY (In Region of Best Adaptability): ____ Days from emergence to first flower <u>1 1 4</u> Days from emergence to 50% of plants in flower																										
3. PLANT (50% Flowering): <table style="width: 100%; font-size: small;"> <thead> <tr> <th></th> <th>Standard Deviation</th> <th>Sample Size</th> </tr> </thead> <tbody> <tr> <td>* <u>2 7.1 0</u> cm Plant Height</td> <td><u>4.30</u></td> <td><u>15</u></td> </tr> <tr> <td>* <u>1 1 3.8</u> cm Plant Width (Spread)</td> <td><u>18.32</u></td> <td><u>15</u></td> </tr> <tr> <td colspan="3"> <u>1</u> Habit: 1=Spreading, Procumbent 2=Upright, Bushy </td> </tr> </tbody> </table>				Standard Deviation	Sample Size	* <u>2 7.1 0</u> cm Plant Height	<u>4.30</u>	<u>15</u>	* <u>1 1 3.8</u> cm Plant Width (Spread)	<u>18.32</u>	<u>15</u>	<u>1</u> Habit: 1=Spreading, Procumbent 2=Upright, Bushy														
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Page 1																										
Note: Use color choices on first page and published color chart to describe color traits.																										

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Application Variety Data			Page 2			Comparison Variety Data		
4. LEAF:			Standard Deviation	Sample Size	Standard Deviation			Sample Size
<u>46.10</u> mm Width of Leaf			<u>.541</u>	<u>15</u>	<u>38.61</u>			<u>1.27</u> <u>15</u>
<u>44.60</u> mm Length of Leaf			<u>.64</u>	<u>15</u>	<u>43.92</u>			<u>.87</u> <u>15</u>
<u>03</u> Leaf Color (Munsell code) <u>(RHS (Yellow-Green Group 146A))</u>						<u>03</u> (Munsell code) <u>(RHS Green 137B)</u>		
<u>2</u> Leaf Division 1=None 2=Lobed 3=Cleft 4=Parted 5=Other (Specify) <u>Pinnately Lobed</u>						<u>2</u>		
<u>7</u> Margins 1=Entire 2=Dentate 3=Crenate 4=Serrate 5=Other (specify) <u>Lobed</u>						<u>7</u>		
<u>1</u> Attachment 1=Sessile or Nearly So (Peruviana) 2=Stalked						<u>1</u>		
5 INFLORESCENCE:			Standard Deviation	Sample Size	Standard Deviation			Sample Size
<u>25.2</u> Number of Florets Per Spike			<u>6.0</u>	<u>15</u>	<u>23.93</u>			<u>7.21</u> <u>15</u>
<u>3.47</u> cm Width of Inflorescence			<u>0.42</u>	<u>15</u>	<u>3.19</u>			<u>0.66</u> <u>15</u>
<u>3.91</u> cm Height (Depth) of Inflorescence			<u>1.66</u>	<u>15</u>	<u>5.49</u>			<u>2.88</u> <u>15</u>
<u>4</u> Inflorescence Type: 1=Solitary 2=Panicle 3=Cyme 4=Corymb						<u>4</u>		
<u>2</u> Spike Openness (at seed stage): 1=Compact 2=Open						<u>2</u>		
<u>2</u> Spike Shape: 1=Flat 2=Dome 3=Globe 4=Other (specify) _____						<u>2</u>		
6 FLOWERS			Standard Deviation	Sample Size	Standard Deviation			Sample Size
<u>14.2</u> mm Floret Diameter			<u>0.23</u>	<u>15</u>	<u>14.3</u>			<u>0.25</u> <u>15</u>
<u>0.15</u> mm Eye Diameter			<u>0.2</u>	<u>15</u>	<u>0.17</u>			<u>0.02</u> <u>15</u>
mm Margin Width								
* <u>1</u> Petals: 1=Not Ruffled 2=Ruffled						<u>1</u>		
* <u>17</u> Monocolor or Basic Color (Munsell code) <u>RHS (Purple- Violet 82-A)</u>						<u>17</u> Munsell code <u>(RHS Violet 86B)</u>		
* <u>05</u> Eye Color (Munsell code) <u>(RHS Yellow 8D)</u>						<u>05</u> (Munsell code) <u>(RHS Yellow 1D)</u>		
Margin Color (Munsell code _____)						(Munsell code _____)		
Stripe Color (Munsell Code _____)						(Munsell code _____)		
Other Color (Specify) _____						_____		
7. SEEDS:			Standard Deviation	Sample Size	Standard Deviation			Sample Size
<u>2.23</u> mg Weight per 1000 Seeds			<u>0.043</u>	<u>15</u>	<u>1.99</u>			<u>.020</u> <u>15</u>
8. DISEASE, INSECT, and ENVIRONMENT RESISTANCE (Rate from 1 (most susceptible) to 9 (most resistant): leave blank if not tested):								
A. Diseases								
Powdery Mildew								
Other (Specify) _____								
B. Insects:								
Leaf Miner								
Budworm								
Spinach Aphid								
Wooley Bear								
Other (Specify) _____								
C. Environment:								
Heat								
Cold								
Other (Specify) _____								
Application Variety Data						Comparison Variety Data		

Note: Use color choices on first page and published color chart to describe color traits.

9. INDICATE A VARIETY WHICH MOST CLOSELY RESEMBLES THE APPLICATION VARIETY FOR EACH CHARACTER LISTED:

CHARACTER	NAME OF VARIETY	CHARACTER	NAME OF VARIETY
LEAF SIZE	Prairie Verbena Plants of the Southwest	PLANT HABIT	Prairie Verbena Plants of the Southwest
LEAF SHAPE	"	PLANT VIGOR	"
LEAF MARGINS	"	STEM STOCKINESS	"
LEAF COLOR	"	STEM PUBESCENCE	"
FLOWER COLOR	"	SPIKE SHAPE	"

REFERENCES:

Bailey, L.H. 1971. Manual of Cultivated Plants. MacMillan, New York, N.Y.
 Hay, R., P. M. Syngé. 1991. The Colour Dictionary of Garden Plants with House and Greenhouse Plants. Bloomsbury Books, London.
 Munsell Color Chart for Plant Tissues. Macbeth, P.O. Box 230, Newburgh, N.Y. 12551-0230
 The Wise Garden Encyclopedia. 1990. HarperCollins Publishers, New York, N.Y.

COMMENTS (Continue in Exhibit D):

TTU-PV1 is a unique variety of the wildflower Glandularia bipinnatifida (Nutt) which was previously classified as Verbena bipinnatifida (Nutt) and is commonly known as Prairie Verbena. TTU-PV1 is a more compact plant with more finely dissected leaves and a more full growth habit that produces a very full looking ornamental for the garden. The inflorescence of TTU PV1 is more compact and has a rich purple color with a small yellow eye that gives a darker overall appearance to the flower display than the commercial.

(Images attached to original submission)

INSTRUCTIONS

Please read instructions carefully before completing the attached form. The Objective Description Form is a necessary part of an application for Plant Variety Protection (Breeder's Rights) in the United States of America. It is designed to guide the applicant in describing a plant variety in detail so that comparisons with other varieties may be done in a meaningful way. It is in the applicant's best interest to describe the application variety as completely as possible to establish an adequate variety description.

The applicant's name and complete address should be at the top of the form. The country should be included since it is needed when mailing to some areas. The name of the variety is also entered at the top of the form. The Plant Variety Protection Office will assign a unique PVPO Number to each application and enter it below the variety name.

A list of color choices is given at the top of the form. The color choices are to be used, along with the color codes from the "Munsell Color Chart" or other published color chart, when describing a color trait of the variety.

Choose one variety to use as a comparison variety throughout the Objective Description Form. Describe the comparison variety in the right-hand column for all traits on form. The variety that you choose should be the most similar one in terms of background and morphology. It should be the same one used in the Exhibit 8 to describe the novelty of the application variety. The comparison variety should be grown in trials with the application variety for 2-3 location/years (environments) in the region of best adaptability. The varietal and environmental data collected should remain available for an additional 3 years to resolve any questions concerning comparisons or descriptions of varieties.

In general, measurements of quantitative traits should be taken on 15-25 randomly selected plants or plant parts to obtain averages and statistics that describe a typical planting of the variety. For each of the measurable traits, report the mean, the number of plants measured, and the standard deviation.

$$\text{Standard Deviation} = \sqrt{\frac{\sum (X - \bar{X})^2}{(N-1)}}$$

14

DISEASE AND INSECT REACTIONS: Test as many disease and insect reactions as possible BEFORE applying for protection. BEST: Test reactions for at least the 5 most common diseases or insects for the region in which the variety is best adapted. Many older varieties were tested extensively for disease and insect reactions. More complete information in these sections of the application may speed the determination of distinctness.

EXHIBIT D

Additional Description of TTU-PV1

TTU-PV1 is a unique variety of the wildflower *Glandularia bipinnatifida* (Nutt) (Prairie Verbena). It has been selected from our breeding program for its finely dissected foliage (Fig. 1) which allows it to look for dense. The larger flower head (Fig. 2) provides a greater floral coverage on the plant. In addition, and its deeper foliage and flower color (Fig. 3 a-b) makes the plant more attractive from a distance as well as with close observation.

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICEEXHIBIT E
STATEMENT OF THE BASIS OF OWNERSHIP

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). The information is held confidential until the certificate is issued (7 U.S.C. 2426).

1. NAME OF APPLICANT(S) Texas Tech University	2. TEMPORARY DESIGNATION OR EXPERIMENTAL NUMBER TTU-PV1	3. VARIETY NAME Raider Amethyst
4. ADDRESS (Street and No., or R.F.D. No., City, State, and ZIP, and Country) Director of Technology Transfer, Box 42007 Texas Tech University Lubbock, TX 79409-2007	5. TELEPHONE (include area code) (806) 742-4105	6. FAX (include area code) (806) 742-4102
7. PVPO NUMBER App # 200300277		

8. Does the applicant own all rights to the variety? Mark an "X" in the appropriate block. If no, please explain. ☒ YES ☐ NO9. Is the applicant (individual or company) a U.S. national or a U.S. based company? If no, give name of country. ☒ YES ☐ NO10. Is the applicant the original owner? ☒ YES ☐ NO If no, please answer one of the following:

a. If the original rights to variety were owned by individual(s), is (are) the original owner(s) a U.S. National(s)?

☐ YES ☐ NO If no, give name of country

b. If the original rights to variety were owned by a company(ies), is (are) the original owner(s) a U.S. based company?

☐ YES ☐ NO If no, give name of country

11. Additional explanation on ownership (Trace ownership from original breeder to current owner. Use the reverse for extra space if needed):

Cynthia McKenney and Dick Auld are the original breeders of this release. Both are employed by Texas Tech University who is the Owner of this germplasm. Texas Tech University is a Texas State Supported Institution.

PLEASE NOTE:

Plant variety protection can only be afforded to the owners (not licensees) who meet the following criteria:

1. If the rights to the variety are owned by the original breeder, that person must be a U.S. national, national of a UPOV member country, or national of a country which affords similar protection to nationals of the U.S. for the same genus and species.
2. If the rights to the variety are owned by the company which employed the original breeder(s), the company must be U.S. based, owned by nationals of a UPOV member country, or owned by nationals of a country which affords similar protection to nationals of the U.S. for the same genus and species.
3. If the applicant is an owner who is not the original owner, both the original owner and the applicant must meet one of the above criteria.

The original breeder/owner may be the individual or company who directed the final breeding. See Section 41(a)(2) of the Plant Variety Protection Act for definitions.

According to the Paperwork Reduction Act of 1996, an agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0551-0055. The time required to complete this information collection is estimated to average 0.1 hour per response, including the time for reviewing the instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, gender, religion, age, disability, sexual orientation, marital or family status, political beliefs, parental status, or protected genetic information. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at 202-720-2590 (voice and TDD).

To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 14th and Independence Avenue, SW, Washington, D.C. 20250-6410 or call (202) 720-6964 (voice and TDD). USDA is an equal opportunity provider and employer.